

# **Montana Fish, Wildlife & Parks**

## **SPECIFICATIONS FOR WORK SPECIAL PROVISIONS**

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## **1. PROJECT DESCRIPTION**

The Project involves construction work associated with:

**Kelly Island Fishing Access Site (FAS) Site Improvements Project  
Fish, Wildlife & Parks (FWP) project # 7133707  
Located in Missoula County, MT**

The project generally includes expansion of existing and construction of new parking areas, access road rehabilitation and expansion involving clearing and grubbing, excavation/embankment construction, gravel base course and asphalt surfacing, conserved topsoil placement, and incidentals, replacement and relocation of the existing boat ramp, and rehabilitating and stabilizing the river bank.

## **2. PROJECT RELATED CONTACTS**

Project contacts are designated as follows:

<b>Owner:</b>	Montana FWP 1420 E. Sixth Ave. PO Box 200701 Helena, MT 59620-0701
<b>FWP Project Representative:</b>	Mark McNearney, P.E. FWP Project Manager 1522 9 <sup>th</sup> Avenue Helena, MT 59620 406-841-4009 (wk) 406-431-4033 (cell) 406-841-4004 (fax)

## **3. SITE INSPECTION**

All Bidders should satisfy themselves as to the construction conditions by personal examination of the site described in this document. Bidders are encouraged to make any investigations necessary to assess the nature of the construction and the difficulties to be encountered, see General Conditions, Article 3.

## **4. SOILS INFORMATION**

Geotechnical investigation work has not been done for this Project. It is the responsibility of the Bidders to conduct all investigations and determine the soil type and digging conditions that may be encountered with this Project prior to bid preparation, see General Conditions, Article 3.

## **5. PROJECT REPRESENTATIVE, INSPECTIONS, AND TESTING**

The Contractor's work will be periodically tested and observed to insure compliance with the Contract Documents. Complete payment will not be made until the Contractor has demonstrated that the work is complete and has been performed as required. If the Project Representative detects a discrepancy between the work and the requirements of the Contract Documents at any time, up to and including final inspection, such work will not be completely paid for until the Contractor has corrected the deficiency, see General Conditions, Article 9.

The Project Representative will periodically monitor the construction of work to determine if the work is being performed in accordance with the contract requirements. The Project Representative does not have the authority or means to control the Contractor's methods of construction. It is, therefore, the Contractor's responsibility to utilize all methods, equipment, personnel, and other means necessary to assure that the work is installed in compliance with the Drawings and Specifications, and laws and regulations applicable to the work. Any discrepancies noted shall be brought to the Contractor's attention, who shall immediately correct the discrepancy. Failure of the Project Representative to detect a discrepancy will not relieve the Contractor of his ultimate responsibility to perform the work as required, see General Conditions, Article 3.

The Contractor shall inspect the work as it is being performed. Any deviation from the Contract requirements shall be immediately corrected. Prior to any scheduled observation by the Project Representative, the Contractor shall again inspect the work and certify to the Project Representative that he has inspected the work and it meets the requirements of the Contract Documents. The Project Representative may require uncovering of work to verify the work was installed according to the contract documents, see General Conditions, Article 12.

The work will be subject to review by the Project Representative. The results of all such observations, and all contract administration, shall be directed to the Contractor only through the Project Representative.

5.1 Services Required by the Contractor. The Contractor shall provide the following services:

- a. Any field surveys to establish locations, elevations, and alignments as stipulated on the Contract Documents. FWP reserves the right to set preliminary construction staking for the project. The Contractor is responsible to notify FWP for any construction staking discrepancies.
- b. Preparation and certification of all required shop drawings and submittals as described in the General Conditions, Article 3.
- c. All testing requiring the services of a laboratory to determine compliance with the Contract Documents shall be performed by an independent commercial testing laboratory acceptable to the Project Representative. The laboratory shall be staffed

with experienced technicians properly equipped, and fully qualified to perform the tests in accordance with the specified standards.

- d. Preparation and submittal of a construction schedule, including submittals, see General Conditions, Article 3. The schedule shall be updated as required, as defined in the Contract Documents.
- e. All Quality Control testing as required by the Contractor's internal policies.
- f. All Quality Assurance testing and/or re-testing as stated in the Contract Documents, see General Conditions, Article 13.

5.2 Services Provided by the Owner. The Owner shall provide the following services at no cost to the Contractor except as required for retests as defined in the Contract Documents.

- a. The Project Representative may check compaction of backfill and surfacing courses using laboratory testing submittal information supplied by the Contractor. These tests are to determine if compaction requirements are being fulfilled in accordance with the Contract Documents. It is ultimately the responsibility of the Contractor to insure that this level of compaction is constant and met in all locations.
- b. Any additional Quality Assurance testing deemed appropriate by the Owner, at the Owner's expense.

## **6. ENGINEERING INTERPRETATIONS**

Timely Engineering decisions on construction activities or results have an important bearing on the Contractor's schedule. When engineering interpretation affects a plan design or specifications change, it should be realized that more than 24 hours may be required to gain the necessary Owner participation in the decision process including time for formal work directive, or change order preparation as required.

## **7. REJECTED WORK**

Any defective work or nonconforming materials or equipment that may be discovered at any time prior to the expiration of the warranty period, shall be removed and replaced with work or materials conforming to the provisions of the Contract Documents, see General Conditions, Article 12. Failure on the part of the Project Representative to condemn or reject bad or inferior work, or to note nonconforming materials or equipment on the Contractors submittals, shall not be construed to imply acceptance of such work. The Owner shall reserve and retain all its rights and remedies at law against the Contractor and its Surety for correction of any and all latent defects discovered after the guarantee period (MCA 27-2-208).

Only the Project Representative will have the authority to reject work which does not

conform to the Contract Documents.

## 8. UTILITIES

The exact locations of existing utilities that may conflict with the work are not precisely known. It shall be the Contractor's responsibility to contact the owners of the respective utilities and arrange for field location services. **One Call Locators, 1-800-424-5555**

The Contract Documents may show utility locations based on limited field observation and information provided to the Project Representative by others. **The Project Representative cannot guarantee their accuracy.** The Contractor shall immediately notify the Project Representative of any discrepancies with utility locations as shown on the Contract Drawings and/or their bury depths that may in any way affect the intent of construction as scoped in these specifications.

There will be no separate payment for exploratory excavation required to locate underground utilities.

8.1 Notification. The Contractor shall contact, in writing, all public and private utility companies that may have utilities encountered during excavation. The notification includes the following information:

- a. The nature of the work that the Contractor will be performing.
- b. The time, date and location that the Contractor will be performing work that may conflict with the utility.
- c. The nature of work that the utility will be required to perform such as moving a power pole, supporting a pole or underground cable, etc.
- d. Requests for field location and identification of utilities.

A copy of the letter of notification shall be provided to the Project Representative. During the course of construction, the Contractor shall keep the utility companies notified of any change in schedule, or nature of work that differs from the original notification.

8.2 Identification. All utilities that may conflict with the work shall be the Contractor's responsibility to locate before any excavation is performed. Field markings provided by the utility companies shall be preserved by the Contractor until actual excavation commences. All utility locations on the Drawings should be considered approximate and should be verified in the field by the Contractor. The Contractor shall also be responsible for locating all utilities that are not located on the Drawings.

Utilities are depicted on the Contract Documents in accordance with their achieved "Quality Levels," as defined in the American Society of Civil Engineer's Document, ASCE 38, "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data." Reliance upon these data for

risk management purposes during bidding does not relieve the Contractor, or Utility Owner from following all applicable utility damage prevention statutes, policies, and/or procedures during construction. It is important that the Contractor investigates and understands the scope of work between the project Owner and Engineer regarding scope of limits of the utility investigations leading to these utility depictions. Definitions of Quality Levels are described as follows:

- a. "QUALITY LEVEL A" – (QLA): LOCATING THROUGH EXCAVATION. QLA data are highly accurate and are obtained by surveying an exposed utility. As such, both horizontal and vertical data are recorded. Survey accuracies are typically set at 15mm (1/2-inch) vertically, and to project survey standards horizontally (typically the same as for topography features), although these survey accuracies and precisions are generally left to the owner to specify in a scope of work. In addition to the applicable standard of care and any other additional standards imposed by commercial indemnity clauses, the accuracy of these location data is also typically guaranteed. Other data typically characterized include material type, surface elevation, utility size/capacity, outside dimensions, and configurations, soil type, and utility condition.
- b. "QUALITY LEVEL B" – (QLB): DESIGNATING. QLB information is obtained through the application of appropriate surface geophysical methods to identify the existence and approximate horizontal location of utilities (a utility's "designation") within the project limits, followed by survey, mapping, and professional review of that designation. Underground utilities are identified by interpretation of received signals generated either actively or passively, and through correlating these received signals with visible objects (QLC) and record data (QLD) to determine function. Designated utilities that can't be identified are labeled as "unknowns." Although approximate has no accuracy associated with it, generally the locations are within inches rather than feet. The more utility congested the area or the deeper the utilities, the less likely it is that the designations will achieve that accuracy. These designations are then surveyed to project accuracies and precisions, typically third-order accuracy similar to other topography features. Note that surveying existing one-call marks does not lead to QLB data, since the genesis of the marks was not under the direct responsible charge of the professional certifying the QLB depictions, and one-call generally does not address unknown utilities, privately owned utilities, utilities without records, abandoned utilities, and so on. Nor does the professional have knowledge of the field technician's qualifications, training, and level of effort.
- c. "QUALITY LEVEL C" – (QLC): SURFACE VISIBLE FEATURE SURVEY. QLC builds upon the QLD information by adding an

independent detailed topography site survey for surface-visible appurtenances of subsurface utilities including but not limited to fire hydrants, valves, risers, and manholes. Professional judgment is used to correlate the QLD data to the surveyed features, thus increasing the reliability of both utility location and existence. It is a function of the professional to determine when records and features do not agree and resolve discrepancies. This may be accomplished by depiction of a utility line at quality level D, effectively bypassing or disregarding (but still depicting) a surveyed structure of unknown origin. Additional resolution may result from consultation with utility owners.

- d. "QUALITY LEVEL D" – (QLD): EXISTING RECORDS RESEARCH. QLD is the most basic level of information. Information is obtained from the review and documentation of existing utility records, verbal accounts, and/or one-call markings (to determine the existence of major active utilities and their approximate locations).

- 8.3 Removal or Relocation of Utilities. All electric power, street lighting, gas, telephone, and television utilities that require relocation will be the responsibility of the utility owner. A request for extending the specified contract time will be considered if utility owners cause delays.
- 8.4 Public Utilities. Water, sewer, storm drainage, and other utilities owned and operated by the public entities shall, unless otherwise specifically requested by the utility owner, be removed, relocated, supported or adjusted as required by the Contractor at the Contractor's expense. All such work shall be in accordance with these Contract Documents, or the Owner's Standard Specifications or written instructions when the work involved is not covered by these Specifications.
- 8.5 Other Utilities. Utilities owned and operated by private individuals, railroads, school districts, associations, or other entities not covered in these Special Provisions shall, unless otherwise specifically requested by the utility owner, be removed, relocated, supported or adjusted as required by the Contractor at the Contractor's expense. All work shall be in accordance with the utility owner's directions, or by methods recognized as being the standard of the industry when directions are not given by the owner of the utility.
- 8.6 Damage to Utilities and Private Property. The Contractor shall protect all utilities and private property and shall be solely responsible for any damage resulting from his construction activities. The Contractor shall hold the Owner and Project Representative harmless from all actions resulting from his failure to properly protect utilities and private property. All damage to utilities shall be repaired at the Contractor's expense to the full satisfaction of the owner of the damaged utility or property. The Contractor shall provide the

Owner with a letter from the owner of the damaged utility or property stating that it has been repaired to the utility owner's full satisfaction.

- 8.7 Structures. The Contractor shall exercise every precaution to prevent damage to existing buildings or structures in the vicinity of his work. In the event of such damages, he shall repair them to the satisfaction of the owner of the damaged structure at no cost to the Owner.
- 8.8 Overhead Utilities. The Contractor shall use extreme caution to avoid a conflict, contact, or damage to overhead utilities, such as power lines, streetlights, telephone lines, television lines, poles, or other appurtenances during the course of construction of this project.
- 8.9 Buried Gas Lines. The Contractor shall provide some means of overhead support for buried gas lines exposed during trenching to prevent rupture in case of trench caving.
- 8.10 Pavement Removal. Where trench excavation or structure excavation requires the removal of curb and gutter, concrete sidewalks, or asphalt or concrete pavement, the pavement or concrete shall be cut in a straight line parallel to the edge of the excavation by use of a spade-bitted air hammer, concrete saw, colter wheel, or similar approved equipment to obtain a straight, square clean break. Pavement cuts shall be 2 feet wider than the actual trench opening.
- 8.11 Survey Markers and Monuments. The Contractor shall use every care and precaution to protect and not disturb any survey marker or monuments, such as those that might be located at lot or block corners, property pins, intersection of street monuments or addition line demarcation. Such protection includes markings with flagged high lath and close supervision. No monuments shall be disturbed without prior approval of the Project Representative. Any survey marker or monument disturbed by the Contractor during the construction of the project shall be replaced at no cost to the Owner by a licensed land surveyor.
- 8.12 Temporary Utilities. The Contractor shall provide all temporary electrical, lighting, telephone, heating, cooling, ventilating, water, sanitary, fire protection, and other utilities and services necessary for the performance of the work. All fees, charges, and other costs associated therewith shall be paid for by the Contractor.

## **9. CONSTRUCTION SAFETY**

The Contractor shall be solely and completely responsible for conditions of the jobsite, including safety of all persons (including employees and subcontractors) and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours. Safety provisions shall conform to U.S. Department of

Labor (OSHA), and all other applicable federal, state, county, and local laws, ordinances, codes, and regulations. Where any of these are in conflict, the more stringent requirement shall be followed. The Contractor's failure to thoroughly familiarize himself with the aforementioned safety provisions shall not relieve them from compliance with the obligations and penalties set forth therein, see General Conditions, Article 10.

## **10. CONSTRUCTION LIMITS AND AREAS OF DISTURBANCE**

- 10.1 Construction Limits. Where construction easements or property lines, are not specifically called out on the Contract Documents, limit the construction disturbance to ten (10) feet, when measured from the edge of the slope stake grading, or to the adjacent property line, whichever is less. Disturbance and equipment access beyond this limit is not allowed without the written approval of both the Project Representative and the Owner of the affected property. If so approved, disturbance beyond construction limits shall meet all requirements imposed by the landowner; this includes existing roads used and/or improved as well as the construction of new access roads. Special construction, reclamation, or post-construction reclamation or other closure provisions required by the landowner on access roads beyond the construction limits shall be performed by the Contractor at no additional cost to the Owner.
- 10.2 Areas of Disturbances. Approved areas of disturbance are those areas disturbed by construction activities within the construction limits and along designated or approved access routes. Such areas may require reclamation and revegetation operations, including grading to the original contours, top soiling with salvaged or imported topsoil, seeding, fertilizing, and mulching as specified herein. Other areas that are disturbed by the Contractor's activities outside of the limits noted above will be considered as site damage or unapproved areas of disturbance, see General Conditions, Articles 3 and 10. This includes areas selected by the Contractor outside the defined construction limits for mobilization, offices, equipment, or material storage.

## **11. DECONTAMINATE CONSTRUCTION EQUIPMENT**

Power wash all construction equipment entering the project site to prevent the spread of noxious weeds and aquatic invasive species. This applies to all FWP projects, whether or not individual construction permits specifically address cleaning of equipment.

## **12. TREE PROTECTION AND PRESERVATION**

The Contractor and the Owner shall individually inspect all trees within the project construction limits prior to construction. The Owner shall determine which trees are to be removed and which trees are to be preserved. Construction of the grading, utilities and various roadway facilities must not significantly damage the trees root system or hinder it's chances for survival. Reasonable variations from the Contract Documents, as directed by the Project Representative, may be employed to ensure the survival of

trees.

### **13. CONSTRUCTION SURVEYS**

The Contractor will be responsible for all layout and construction staking utilizing the Project Representative's existing control and coordinate data for the project. Dimensions and elevations indicated in layout of work shall be verified by the Contractor. Discrepancies between Drawings, Specifications, and existing conditions shall be referred to the Project Representative for adjustment before work is performed.

The Project Representative may set location and grade stakes prior to construction; however, it is ultimately the responsibility of the Contractor to check and verify all construction staking for the project.

Existing survey control (horizontal and vertical) has been set for use in the design and ultimately the construction of these improvements. A listing of the coordinates and vertical elevation for each of these control points may be included in the project drawings.

The Contractor will be responsible for preserving and protecting the survey control until proper referencing by the Contractor has been completed. Any survey control obliterated, removed, or otherwise lost during construction will be replaced at the Contractor's expense.

Contractor shall be aware of property pins and survey monuments. Damage to these pins will require replacement of such by a registered land surveyor at no cost to the owner.

The Contractor shall provide construction staking from the Contractor's layouts and the control points. Contractor's construction staking includes at a minimum:

1. Slope stakes located at critical points as determined by the Project Representative.
2. Blue tops every longitudinally and transversely for subgrade and crushed base to verify finish grading of course.
3. Location and grade stakes for drainage features and retaining walls.
4. Location stakes for roadside safety items, permanent and temporary traffic control, and misc. items as determined by the Project Representative.

Original field notes, computations and other records take by the Contractor for the purpose of quantity and progress surveys shall be furnished promptly to the Project Representative and shall be used to the extent necessary in determining the proper amount of payment due to the Contractor.

### **14. MATERIAL SOURCES AND CONSTRUCTION WATER**

The Contractor shall be responsible for locating all necessary material sources, including

aggregates, earthen borrow and water necessary to complete the work. The Contractor shall be responsible for meeting all transportation and environmental regulations as well as paying any royalties. The Contractor shall provide the Project Representative with written approvals of landowners from whom materials are to be obtained, prior to approval.

The Contractor may use materials from any source, providing the materials have been tested through representative samples and will meet the Specifications.

Water for compaction efforts shall be supplied by the Contractor.

## **15. MATERIALS SALVAGE AND DISPOSAL**

Notify the Owner for any material salvaged from the project site not identified in the Contract Documents. The Owner reserves the right to maintain salvaged material at the project site, compensate the Contractor for relocation of salvaged material, or agreed compensation to Owner for material salvaged by the Contractor.

Haul and waste all waste material to a legal site and obey all state, county, and local disposal restrictions and regulations.

## **16. STORED MATERIALS**

Contractor shall use an approved storage area for materials. Materials and/or equipment purchased by the Contractor may be compensated on a monthly basis. For compensation, provide the Project Representative invoices for said materials, shop drawings and/or submittals for approval, and applicable insurance coverage, see General Conditions, Article 9.

## **17. STAGING AND STOCKPILING AREA**

Contractor shall use staging and stockpiling sites for to facilitate the project as approved by the Owner. Contract Documents may show approved staging and stockpiling locations. Notify Owner within 24 hours for approval of staging and stockpiling sites not shown on the Contract Drawings.

## **18. SECURITY**

The Contractor shall provide all security measures necessary to assure the protection of equipment, materials in storage, completed work, and the project in general.

## **19. CLEANUP**

Cleanup for each item of work shall be fully completed and accepted before the item is considered final. If the Contractor fails to perform cleanup within a timely manner the

Owner reserves the right to withhold final payment.

Review these Contract Documents for additional Final Cleanup specifications for specific measures, associated with Contractor responsibilities and final payment.

## **20. ACCESS DURING CONSTRUCTION**

Provide emergency access at all times within the project throughout the construction period.

## **21. CONSTRUCTION TRAFFIC CONTROL**

The Contractor is responsible for providing safe construction and work zones within the project limits by implementing the rules, regulations, and practices of the Manual on Uniform Traffic Control Devices, current edition.

## **22. SANITARY FACILITIES**

Provide on-site toilet facilities for employees of Contractor and Sub-Contractors and maintain in a sanitary condition.

## **23. CONTRACT CLOSEOUT**

The Contractor's Superintendent shall maintain at the project site, a "Record Set of Drawings" showing field changes, as-built elevations, unusual conditions encountered during construction, and such other data as required to provide the Owner with an accurate "as constructed" set of record drawings. The Contractor shall furnish the "Record Set" to the Project Representative following the Final Inspection of the Project.

The Contractor's final payment will not be processed until the "Record Set" of drawings are received and approved by the Project Representative.

## **24. MEASUREMENT AND PAYMENT**

Review these Contract Documents for additional Measurement and Payment specifications for definitions. Quantities are listed on the Bid Proposal for Payment Items. Additional material quantities, volumes, and measurements may be shown on the Contract Document drawings and/or specifications.

Unit Price quantities and measurements shown on the Bid Proposal are for bidding and contract purpose only. Quantities and measurements supplied, completed for the project, and verified by the Project Representative shall determine payment. Each unit price will be deemed to include an amount considered by the Contractor to be adequate to cover Contractor's overhead and profit for each bid item.

The Owner or Contractor may make a Claim for an adjustment in Contract Unit Price if

the quantity of any item of Unit Price Work performed by the Contractor differs materially and/or significantly (increase or decrease by 50%) from the estimated quantity indicated on the Bid Proposal.

Lump sum bid item quantities will not be measured. Payment for these lump sum bid proposal items will be paid in full amount listed on the Bid Proposal when accepted by the Project Representative, unless specified otherwise.

## **SPECIFICATIONS FOR WORK**

### **TECHNICAL PROVISIONS**

#### **Incorporation of Montana Public Works Technical Specifications.**

The Technical Specifications as found in Montana Public Works Standard Specifications (MPWSS), Sixth Edition, April 2010 and/or current Addendums or Revisions; are hereby incorporated by reference and made a part of this Contract:

#### **Incorporation of Montana Fish, Wildlife & Parks Technical Specifications and Modifications to MPW Technical Specifications.**

In addition to the MPWSS Technical Specifications are the following Montana Fish, Wildlife & Parks Technical Specifications (modifications to MPWSS Technical Specifications).

SECTION 01400 -	Contractor Quality Control & Quality Assurance
SECTION 01450 -	Mobilization/Demobilization
SECTION 01750 -	Final Cleanup
SECTION 01800 -	Erosion and Sediment Control
SECTION 01801 -	Floating Turbidity Curtain
SECTION 02110 -	Geotextiles
SECTION 02112 -	Removal of Existing Pavement, Concrete Curb, Sidewalk, Driveway and/or Structures
SECTION 02230 -	Street Excavation, Backfill, and Compaction
SECTION 02235 -	Crushed Base Course
SECTION 02236 -	Gravel Leveling Course
SECTION 02238 -	Drain Rock
SECTION 02240 -	Riprap
SECTION 02350 -	Bank Stabilization
SECTION 02510 -	Asphalt Concrete Pavement
SECTION 02581 -	Pavement Markings and Markers (Pre-formed Plastic, Paints and Enamels)
SECTION 02820 -	Wooden Rail Fence
SECTION 02910 -	Revegetation
SECTION 02930 -	Signing
SECTION 03284 -	Planting Irrigation
SECTION 03310 -	Structural Concrete
SECTION 03321 -	Curb Stops
SECTION 03350 -	Cable Mat

## SECTION 01400

### CONTRACTOR QUALITY CONTROL AND QUALITY ASSURANCE

Revised section title and revised subsections.

#### **PART 1: GENERAL**

##### 1.1 DESCRIPTION

Revise this section as follows:

- A. This section describes the Contractor quality control testing requirements and quality assurance program.

##### 1.2 References

- A. The following ASTM publication is a part of this specification.  
  
ASTM E 329 Evaluation of Testing and Inspection Agencies as Used in  
Construction

#### **PART 2: PRODUCT- NOT USED**

#### **PART 3: EXECUTION**

##### 3.1 GENERAL

- A. Be responsible for quality control tests and inspections to control contractor production and construction processes. Include in the Contractor quality control system an internal organization, plans, and procedures to produce the specified end product. Assure the system covers all construction operations, both on-site and off-site, and is keyed to the construction sequence. Quality control testing frequency is at Contractor discretion, except where tests are specifically required in the technical specifications for individual products.

- B. Revise this section as follows:

Sampling and testing to assure specification conformance are performed by the Contractor's testing agency as quality assurance testing.

- C. Revise this section as follows:

The Contractor shall select a testing agency to perform quality assurance testing. (ASTM E329 is referenced as a guide to the selection of a qualified testing

agency.) Contractor is responsible for hiring and paying for all QA testing per the contract requirements and all applicable sections of the MPWSS.

- D. Quality assurance testing is performed following the standards in the technical specifications for individual products.

### 3.2 CONTRACTOR COOPERATION WITH QUALITY ASSURANCE AGENCY

- A. Revise this section as follows:

Assure the Owner's personnel and Contractor's quality assurance agency have access to all work areas at all times work is in progress. Provide any special facilities or equipment to access work areas at Contractor expense.

- B. Notify the Engineer of the work ready for quality assurance testing. Establish and update as the construction schedule to provide the Engineer estimated sampling/testing dates and times.

## **PART4: MEASUREMENT AND PAYMENT**

### 4.1 PAYMENT FOR TESTING

- A. Pay for all quality control testing as outlined in Subsection 3.1 above. Mix designs for Portland Cement Concrete and Flowable Fill, mix designs for Asphalt Concrete, and all initial aggregate quality tests are quality control tests and are at Contractor expense. Testing costs are incidental to the work and to be included in the unit price bid for the respective item.

- B. Revise this section as follows:

Contractor will pay all quality assurance testing costs.

### 4.2 RETESTING

Revise this section as follows:

- A. Quality assurance re-testing due to failing initial tests will be performed by the Contractor or the Contractor's quality assurance testing agency, and costs for re-tests will be paid for by the Contractor.

**END OF SECTION 01400**

## **SECTION 01450**

### **MOBILIZATION/DEMOBILIZATION**

Added Section.

#### **PART 1                    GENERAL**

##### **1.1      DESCRIPTION**

- A. This item shall consist of the preparatory work and operations necessary performed by the Contractor for the movement of personnel, equipment, supplies, and incidentals to and from the work site. The work includes those actions necessary for obtaining necessary permits required for mobilization; for the establishment of all offices and facilities necessary to work on the project; for premiums on contract bonds; for insurance for the contract; and for other work on the various items on the project site. Mobilization costs for subcontracted work shall be considered to be included.
- B. Contractor's cost for administration, bonding, insurance, and site documents shall be included in mobilization and shall not be paid as a separate item.
- C. All equipment moved to the project sites shall be in good mechanical condition and free of fuel, oil, lubrication, or other fuel leaks. The Contractor shall immediately remove any equipment potentially or actually discharging environmentally damaging fluids.
- D. All equipment moved to the project sites shall be thoroughly cleaned before it is brought to the sites to prevent the introduction of weed seeds. Equipment removed from the sites may not be returned to the sites again until it is thoroughly cleaned again.

#### **PART 2                    PRODUCTS – NOT USED**

#### **PART 3                    EXECUTION – NOT USED**

#### **PART 4                    MEASUREMENT AND PAYMENT**

##### **4.1      MEASUREMENT**

- A. There will be no direct measurement of this item.

##### **4.2      PAYMENT**

- B. Partial payments for mobilization/demobilization will be made based on the lump sum bid price as follows:

- 25% of the amount bid for mobilization/demobilization when the Contractor has moved on-site and begun construction activities.
  - 50% of the amount bid for mobilization/demobilization when 25% of the contract amount (exclusive mobilization/demobilization) has been completed.
  - 75% of the amount bid for mobilization/demobilization when 50% of the contract amount (exclusive mobilization/demobilization) has been completed.
  - 100% of the amount bid for mobilization/demobilization when 75% of the contract amount (exclusive mobilization/demobilization) has been completed.
- C. Work will likely extend until May, 2015. No separate payment will be made for additional remobilization for 2015 work.

**END OF SECTION 01450**

## **SECTION 01750**

### **FINAL CLEANUP**

Added Section.

#### **PART 1                    GENERAL**

##### **1.1      DESCRIPTION**

- A.      This work consists of final cleanup of the project site prior to final acceptance.

#### **PART 2                    PRODUCTS – NOT USED**

#### **PART 3                    EXECUTION**

##### **3.1      CONTRACTOR RESPONSIBILITIES**

The contractor shall be responsible for final clean up at the end of the project to a level satisfactory to the owner. All construction debris, no matter how small, shall be collected and removed from the site. All wheel ruts shall be filled in and be leveled to match the adjacent grade and material. Re-seeding or re-sodding, or other re-surfacing may be necessary to repair any construction related impacts or damage.

All survey markings, stakes, temporary paint marks, flagging and other devices shall be removed regardless of who installed them. All excess pavement, concrete, gravel, soil, or other construction materials not intended for permanent use shall be removed.

All final slopes shall be dressed manually to remove woody debris, accumulated trash and oversized material. Any new slope or topsoil surfaces shall be hand raked to provide a uniform appearance. The contractor shall dress all gravel, pavement and concrete edges to eliminate abrupt edges and provide a smooth transition. All construction related temporary sediment control devices shall be removed as soon as practical.

#### **PART 4                    MEASUREMENT AND PAYMENT**

##### **4.1      PAYMENT**

Unless specifically noted otherwise, all final cleanup work shall be incidental to other work items in the contract and no separate payment shall be made.

**END OF SECTION 01750**

## SECTION 01800

### EROSION AND SEDIMENT CONTROL

Added Section.

#### PART 1 GENERAL

##### 1.1 DESCRIPTION

- A. This work consists of furnishing, constructing, and maintaining permanent and temporary erosion control and sediment control measures as shown on the project drawings and/or project related construction permits.

#### PART 2 PRODUCTS

##### 2.1 GENERAL

- A. Temporary and erosion control products utilized include but are not limited to backfill material; berms; brush barriers; erosion control blankets, bales, wattles, logs, rolls; erosion control culvert pipe; detention basins; fertilizer; geotextile; mulch; plastic lining; riprap; sandbags; seed; silt fence; and water.

##### 2.2 EROSION CONTROL WATTLES

- A. Where designated, provide a sediment retention product made from straw and coconut fiber reinforced with a 100% bio-degradable netting. Use wood stakes to secure sediment retention product in place, spacing per the manufacturer's recommendations. An acceptable product is *Sediment Stop*, manufactured by *North American Green*, or approved equal.

##### 2.2 EROSION CONTROL BLANKETS

- A. Where designated, provide a sediment retention product made from straw and coconut fiber reinforced with a 100% bio-degradable netting. Use wood stakes to secure sediment retention product in place, spacing per the manufacturer's recommendations. An acceptable product is *BioNet® SI50BN™*, manufactured by *North American Green*, or approved equal.

#### PART 3 EXECUTION

##### 3.1 INSTALLATION

- A. Provide permanent and temporary erosion control measures to minimize erosion and sedimentation during and after construction according to the contract erosion control plan, environmental permits, and as directed by the Project Representative. These erosion control measures shall be designed, implemented, and maintained by the

Contractor in accordance with Best Management Practices (BMPs) to control erosion and sediment release from the work site.

- B. Install permanent and temporary erosion control measures according to the Storm Water Pollution Prevention Plan (SWPPP), if applicable, approved construction permits, and erosion control drawings.
- C. When erosion control measures are not functioning as intended, immediately take corrective action.

## **PART 4                      MEASUREMENT AND PAYMENT**

### **4.1      MEASUREMENT AND PAYMENT**

- A. All items in this section are incidental to the work and no separate payment is made for these items.

**END OF SECTION 01800**

## SECTION 01801

### FLOATING TURBIDITY CURTAIN

Added Section.

#### **PART 1                    GENERAL**

##### **1.1      DESCRIPTION**

- A.      This work consists of furnishing and installing a floating turbidity curtain to control sedimentation and suspended solids during underwater construction methods.

#### **PART 2                    PRODUCTS**

##### **2.1      GENERAL**

- A. Provide a turbidity curtain with a geotextile material curtain, floatation boom, and anchorage system.
- B. Provide a woven geotextile material as approved for turbidity containment by manufacture's recommendations.
- C. An acceptable floating turbidity curtain product is *Layfield Turbidity Curtains*, or approved equal. [www.layfield.com](http://www.layfield.com), (800) 796-6868

#### **PART 3                    EXECUTION**

##### **3.1      INSTALLATION**

- A. Install turbidity curtain parallel to the shoreline around the construction area of disturbance. Turbidity curtain installation is required prior to any and all work below the ordinary high water mark.
- B. Extend the turbidity curtain to the water body bottom at all installation locations.
- C. Provide flexible flotation buoys for the top of the turbidity curtain.
- D. Provide an anchorage system consisting of load lines attached to the bottom of the turbidity curtain. Place anchors every 50' connected to the top of the floatation buoy.
- E. Inspect the turbidity curtain daily to ensure sedimentation is controlled and proper function of the erosion control BMP. Immediately correct turbidity curtain deficiencies before continuing with work. If turbidity curtain deficiencies are not

corrected, the Contractor may be in violation with approved construction permits and may be issued a stop work order by the Project Representative.

- F. Maintain turbidity curtain throughout all work activities until removal approval by the Project Representative. Allow sediment to settle or disperse for 12 hours after construction disturbance prior to removal.

## **PART 4                      MEASUREMENT AND PAYMENT**

### **4.1      GENERAL**

- A. Turbidity curtain will be measured and paid by the linear foot (LF) including all labor, equipment, materials, and incidentals required for the completion of the work.

**END OF SECTION 01801**

## SECTION 02110

### GEOTEXTILES

All applicable portions of this specification section in the MPWSS shall apply with the following additions, deletions and/or modifications.

#### PART 1 GENERAL

##### 1.1 DESCRIPTION

Add the following:

This work also includes the installation of woven geotextile on prepared subgrades, as identified on the project drawings, or as directed by the Project Representative.

##### 1.2 REFERENCES

C. Delete this section and add the following:

Provide geotextile meeting the strength requirements from Table 1. An acceptable Paving Section and Boat Ramp/Riprap product is *PermeaTex 2315* Woven Geotextile from Northwest Linings & Geotextile Products, Inc. and *Mirafi® FW300* Woven Geotextile from Tencate™, respectively, or approved equals.

**Table 1. High Survivability Woven Geotextile Requirements**

			Paving Section	Boat Ramp/ Riprap <sup>1</sup>
	TEST METHODS	UNITS	REQUIREMENTS	
Grab Elongation	ASTM D 4632	%	≤50	≤20
Grab Tensile Strength	ASTM D 4632	lbs	≥300	≥400
Trapezoidal Tear Strength	ASTM D 4533	lbs	≥100	≥145
Puncture Strength	ASTM D 4833	lbs	≥100	
CBR Puncture Strength	ASTM D6241	lbs		≥1,250
Permittivity	ASTM D 4491	Sec <sup>-1</sup>	≥0.05	≥1.5
Apparent Opening Size	ASTM D 4751	Sieve Size (in)	#60 (≤0.01)	#30 (≤0.60)
Ultraviolet Stability (Retained Strength)	ASTM D 4355	%	≥50 after 500 hours of exposure	≥50 after 500 hours of exposure

<sup>1</sup> Machine Direction Values

**END OF SECTION 02110**

## **SECTION 02112**

### **REMOVAL OF EXISTING PAVEMENT, CONCRETE CURB, SIDEWALK, DRIVEWAY AND/OR STRUCTURES**

Revised subsections.

#### **PART 1: GENERAL**

##### **1.1 DESCRIPTION**

- A. The work consists of removing and disposing of existing pavement, concrete curb, combined curb and gutter, sidewalk, private driveways, and crosswalks, along with any structures designated for removal in the contract documents. Details of removals are specified in the contract documents.

#### **PART 2: PRODUCTS -NOT USED**

#### **PART 3: EXECUTION**

##### **3.1 GENERAL**

- A. Dispose of all existing pavement, concrete curb, crosswalk and/or combined curb and gutter specified for removal in the contract documents or directed by the Engineer. Exercise care in such removal to assure that remaining nearby facilities and/or structures are not disturbed. Restore to original condition any such existing facilities or structures damaged by construction activities.
- B. Cut, remove and dispose of designated existing pavement to the lines indicated on the contract documents, or directed by the Engineer. Make straight and approximately vertical cuts of edges along which new pavement is to be placed.
- C. Remove and dispose of existing private concrete driveways and/or sidewalks which interfere with construction of street improvements or which do not match new grade as shown on the contract documents or as directed by the Engineer. Remove such driveways and/or sidewalks to a distance of 8 inches (20cm) behind curbs, or to greater distance if required to properly match the new curb and gutter grade. Remove along the neat line produced by a concrete saw cut. Make cuts to depths of at least 25 percent of the concrete thickness and take care in removing the concrete assuring the slab breaks on the sawed neat line.

## **PART 4: MEASUREMENT AND PAYMENT**

### **4.1 ASPHALTIC CONCRETE PAVEMENT REMOVAL**

- A. Removal and disposal of asphalt concrete pavement is part of Section 2230, Street Excavation, Backfill and Compaction. No separate payment will be made for this item.

### **4.2 CONCRETE REMOVAL**

- A. Remove this subsection
- B. Concrete removal and disposal shall be paid for at the contract unit price bid, constituting full compensation for all equipment, tools and labor, including the performance of all work to provide incidentals necessary to complete this item.
- C. Measurement and payment for concrete removal and disposal will be made only if listed as a separate pay item in the contract documents. If not listed separately in the contract as a bid item, concrete removal and disposal will be included as part of Section 2230, Street Excavation, Backfilling and Compaction.
- D. Revise this section as follows:

Payment will be made under one of the following if identified in the contract documents:

- 1. Concrete Removal - Per Lineal Foot (Meter)
- 2. Concrete Removal - Per Square Yard (Square Meter)
- 3. Concrete Removal- Per Cubic Yard (Cubic Meter)
- 4. Concrete Removal – Per Lump Sum (LPSM)

### **4.3 CONCRETE SAW CUT**

- A. For those projects where concrete saw cutting is a substantial item of work, this item may be measured and paid for at the contract unit price bid per lineal foot (meter), constituting full compensation for all equipment, tools and labor, including the performance of all work to provide incidentals necessary to complete this item.
- B. Payment will be made under the following:
  - 1. Saw Cut for Concrete Pavement, Sidewalk, Driveway, and Curb and Gutter- Per Lineal Foot (Meter).

- C. Measurement and payment for concrete saw cuttings will be made only if listed as a separate item in the bid documents. If not listed in the contract as a bid item, saw cutting shall be part of the Concrete Removal in Section 4.2 above, or part of the Excavation Above Subgrade item in Section 2230, Street Excavation, Backfill and Compaction, Excavation.
4. 4 Payment indicated to include complete compensation for all labor, equipment, materials and incidentals required for the completion of the work.

**END OF SECTION 02112**

## **SECTION 02230**

### **STREET EXCAVATION, BACKFILL AND COMPACTION**

All applicable portions of this specification section in the MPWSS shall apply with the following additions, deletions and/or modifications.

#### **PART 3: EXECUTION**

##### **3.1 CLEARING AND GRUBBING**

Add this part to this subsection as follows:

- D. "Clearing" shall consist of the falling of trees greater than 3 inches diameter breast height (dbh), de-limbing them, and cutting into six-foot sections. Clearing shall also include the disposal of stumps, brush, windfalls, limbs, sticks, piles of sawdust, rubbish, debris, vegetation, and other objectionable material occurring within the clearing limits or which interfere with excavation or embankment.

**END OF SECTION 02230**

## **SECTION 02235**

### **CRUSHED BASE COURSE**

Revised section.

#### **PART 4: MEASUREMENT AND PAYMENT**

Revise this section as follows:

##### **4.2 SQUARE YARD BASIS: CRUSHED BASE COURSE.**

- A. This item is measured and paid for by the square yards (square meters) of crushed base course surface area for furnishing crushed base course of the thickness and gradations specified in the Contract documents, complete in place, at the contract unit price bid for 8" Thickness of 3/4" Minus Crushed Base Course". Price and payment is full compensation for furnishing, crushing, loading, hauling, spreading, shaping, watering and compacting the base course material, and for all tools, labor and incidentals necessary to complete this item.
- B. Payment is made under:
  - 1. 8" Thickness of 3/4" Minus Crushed Base Course - per square yard (square meter).

**END OF SECTION 02235**

## SECTION 02236

### GRAVEL LEVELING COURSE

Added Subsection.

#### PART 1 GENERAL

##### 1.1 DESCRIPTION

- B. This work also consists of placing clean, screened gap-graded gravel leveling course beneath push-in concrete boat ramp slab and concrete cable mat boat ramp blocks.

#### PART 2 PRODUCTS

##### 2.1 GRAVEL LEVELING COURSE GRADATION

- A. Furnish gravel leveling course that is crushed aggregate as shown in Table 1. The gravel leveling course must not contain other deleterious material, such as shale, alkali, mica, or soft flaky particles.

**Table 1. Gravel Leveling Course Gradation**

Sieve Size	Percent Passing
1"	100
3/4"	90-100
3/8"	20-55
No. 4	0-10
No. 8	0-5

#### PART 3 EXECUTION

##### 3.1 PLACEMENT AND SPREADING

- A. Place material to specified depth as indicated on the project drawings. Deposit and spread the material in a uniform layer and screed to make a uniform surface at the specified boat ramp grade as indicated on the project drawings.
- B. Perform compaction efforts by mechanical tamping as approved by the Project Representative.

#### PART 4 MEASUREMENT AND PAYMENT

- 4.1 Gravel Leveling Course will not be measured for payment and is considered incidental to other work items in this Contract.

**END OF SECTION 02236**

## SECTION 02238

### DRAIN ROCK

Added Section.

#### PART 1 GENERAL

##### 1.1 DESCRIPTION

- A. This work consists of furnishing, placing, and finishing drain rock placement at designated areas on the project drawings or as directed by the Project Representative.

#### PART 2 PRODUCTS

##### 2.1 DRAIN ROCK GRADATION

- A. Furnish drain rock that is a crushed aggregate as shown in Table 1:
- B. The drain rock material must be non-plastic. A minimum of 70 percent by weight of the drain rock must have at least one fractured face.

**Table 1. Drain Rock Gradation**

Sieve Size	Percent Passing
4 inch	100
¾ inch	0-10
No. 4	0-5

#### PART 3 EXECUTION

##### 3.1 GENERAL

- A. Install drain rock according to the project drawings or as directed by the Project Representative.

#### PART 4 MEASUREMENT AND PAYMENT

##### 4.1 GENERAL

- A. Drain rock placement will not be measured for payment and is considered incidental to other work items in this Contract.

**END OF SECTION 02238**

## SECTION 02240

### RIPRAP

Added Section.

#### **PART 1                    GENERAL**

##### **1.1      DESCRIPTION**

- A.      This work consists of conserving and/or furnishing, placing, and finishing riprap rock placement at designated areas on the project drawings or as directed by the Project Representative.

#### **PART 2                    PRODUCTS – NOT USED**

##### **2.1      RIPRAP GRADATION**

- A.      Furnish hard, durable, angular rock that is resistant to weathering and water action and free of organic or other unsuitable material. Do not use shale, rock with shale seams, or other fissile or fissured rock that may break into smaller pieces in the process of handling and placing. Incorporate the following gradation for riprap installations as shown in Table 1:

**Table 1. Class 6 Riprap Gradation**

<b>Percent of Rock by Mass</b>	<b>Approximate Cubic Dimension (inches)</b>
20	28 to 34
40	22 to 28
30	10 to 22
10	0 to 10

#### **PART 3                    EXECUTION**

##### **3.1      GENERAL**

- A. Place riprap to form a well-graded mass to its full thickness in operation to avoid displacing the underlying geotextile or other material. Do not place riprap material by methods that cause segregation or damage to the prepared surface. Place or rearrange individual rocks by mechanical or hand methods to obtain a dense uniform blanket with a reasonably smooth surface.
- B. Install conserved and/or imported riprap according to the project drawings or as directed by the Project Representative.

#### **PART 4                    MEASUREMENT AND PAYMENT**

#### 4.1 GENERAL

- A. Imported Riprap w/Geotextile Fabric placement will be measured and paid by the cubic yard (CY) including all labor, equipment, materials, and incidentals required for the completion of the work

**END OF SECTION 02240**

## **SECTION 02350**

### **BANK STABILIZATION**

Added Section.

#### **PART 1                    GENERAL**

##### **1.1      DESCRIPTION**

- A.      This work consists of stabilization of the streambank per the details provided in the Project Drawings. Stabilization includes excavation of existing bank, construction/placement of soil bundles, placement of rip-rap, embankment to finished grade within the excavation limits and bank vegetation.

#### **PART 2                    PRODUCTS**

##### **2.1      ON-SITE EMBANKMENT (NATIVE SOIL FILL)**

- A.      Per Section 02230

##### **2.2      BORROW MATERIALS (FOR EMBANKMENT IN-PLACE)**

- A.      Per Section 02230

##### **2.3      RIPRAP WITH SEPARATION GEOTEXTILE**

- A.      Per Section 02240 and Section 02210

##### **2.4      SOIL BUNDLE FABRIC**

- A.      Soil bundle fabric shall consist of a double layer Koirmat 900/Bio-Mat 90 or approved equal.

##### **2.5      BOW FASCINE**

- A.      Bow Fascine shall consist of a 12" to 14" inch diameter pine.

##### **2.6      RED OSIER DOGWOOD OR SANDBAR WILLOWS**

- A.      Per Section 02910.

##### **2.7      RIPARIAN SEED MIX**

- A.      Per Section 02910.

## **PART 3                      EXECUTION**

### **3.1      CLEARING AND GRUBBING**

- A. Perform clearing and grubbing including the excavation, removal, and disposal of roots, stumps, sod, or any organic material and buried debris from within the construction limits. Topsoil to be salvaged and re-used for re-vegetation of bank. Additional soil may be utilized throughout the site.

### **3.2      EXCAVATION**

- A. Excavate to the depths and specified lines and grades shown on the plans for the placement of wrapped Soil Bundles. Stockpile soil on-site for use in manufacturing of soil bundles.
- B. Existing riprap in bank area to be excavated, salvaged, and stockpiled on-site for re-use.

### **3.3      PLACEMENT OF SOIL BUNDLES**

- A. Compacted Pit-Run Gravel and Rip-Rap to be placed per the lines and grades shown on the plans and the details of the Project Drawings. Bow Fascine shall be placed up on the toe of the slope per the Project Drawings.
- B. Koirmat 900/Bio-Mat 90 or Approved Equal to be laid out and on-site fill to be placed in lifts of 12" to be compacted to 80% max dry density, typ. If beneath pavement, soil shall be compacted to 95% max dry density.
- C. Geotextile to be folded over per Project Drawings and 18" wooden stakes to be placed within soil bundle at 6' O.C.
- D. Irrigation lateral with soil pins to be placed on top of completed soil bundle prior to next soil bundle being constructed.

### **3.4      REVEGETATION AND PLANTING**

- A. Planting of Red Osier Dogwood or Sandbar Willow Bundles to be completed per the specifications in Section 02910.
- B. Bio-D Straw mat and Riparian Seed Mix to be placed at top of bank per specification in Section 02910.

### **3.5      BANK PROTECTION FROM PEDESTRIANS**

- A. Until Wood Rail Fence is in place, temporary orange construction fence shall be placed along top of bank for protection.

## **PART 4**

## **MEASUREMENT AND PAYMENT**

### **4.1 GENERAL**

- A. Bank Stabilization placement will be measured and paid by the lineal foot (LF) of bank completed, defined by the top of the first soil bundle lift measured at the face, including all labor, equipment, materials, and incidentals required for the completion of the work.

**END OF SECTION 02350**

## **SECTION 02510**

### **ASPHALT CONCRETE PAVEMENT**

Revised section.

#### **4.2 SQUARE YARD BASIS:**

Revise this section as follows:

##### **A. Asphalt Concrete Pavement**

1. These items are measured by the square yard of asphalt paving surface area. The quantities measured for payment are the square yards (square meters) of specified thickness of asphalt paving in the completed and accepted work as measured in the field. 2" Thickness PG 58-28 Asphalt Concrete Pavement (Type B) is paid for at the unit price bid per square yard (square meter).

Revise this section as follows:

3. Payment is made under: 2" Thickness PG 58-28 Asphalt Concrete Pavement (Type B)

**END OF SECTION 02510**

## **SECTION 02581**

### **PAVEMENT MARKINGS AND MARKERS (PRE-FORMED PLASTIC, PAINTS AND ENAMELS)**

Revised subsection.

#### **PART 4: MEASUREMENT AND PAYMENT**

##### **4.1 GENERAL**

Revise this subsection as follows:

- A. Plastic pavement striping is measured for payment by the lump sum to include all lot striping and pavement markings including all markings for the ADA van parking stall.

**END OF SECTION 02581**

## SECTION 02820

### WOODEN RAIL FENCE

#### Added Section.

#### **PART 1 GENERAL**

##### 1.1 DESCRIPTION

- A. This work consists of furnishing, erection, and placement of new wooden rail fence.

#### **PART 2 PRODUCTS**

##### 2.1 GENERAL

- A. **Wooden Posts:** Posts shall be made from western larch, lodgepole pine, ponderosa pine, or douglas-fir. They shall have the bark removed, be well seasoned, sound, and straight-grained. They shall be finished round. Posts shall be 5 inch minimum diameter and 6 feet in length, or as specified in the project drawings. All posts shall be fully treated with a solution conforming to AWP standards. Penetration shall be at least 1/2 inch. **Certification of AWP treatment shall be provided to the Project Manager.**
- B. **Wooden Pole Rail:** Wooden pole rails shall be made from western larch, lodgepole pine, ponderosa pine, or douglas-fir. They shall have the bark removed, be well seasoned, sound, and straight-grained. They shall be finished half round. Poles shall be 4 inch minimum diameter and **12 (maximum)** feet in length. All poles shall be fully treated with a solution conforming to AWP standards. Penetration shall be at least 1/2 inch. **Certification of AWP treatment shall be provided to the Project Manager.**
- C. **Post-Pole Hardware:** Fasten poles to posts with 6" *Timberlok*® screws (or approved equal).

#### **PART 3 EXECUTION**

##### 3.1 CLEARING AND GRUBBING

- A. "Clearing" shall consist of the falling of trees greater than 3 inches diameter breast height (dbh), de-limbing them, and cutting into six-foot sections. Clearing shall also include the disposal of stumps, brush, windfalls, limbs, sticks, piles of sawdust, rubbish, debris, vegetation, and other objectionable material occurring within the clearing limits or which interfere with excavation or embankment.
- B. "Grubbing" shall consist of the removal from the ground and the disposal of roots, stumps, together with duff, matter, roots, and debris from the grubbing limits.

C. Construction methods for clearing and grubbing operations are as follows:

- (1) No stumps or roots shall remain more than 4 inches above the ground along the fence line.
- (2) Low hanging branches and unsound or unsightly branches on trees or shrubs designated to remain shall be removed as directed. Branches of trees extending over the fence line shall be trimmed to give a clear height of 8 feet above the ground along the fence line. Width of clearing for fence line shall be 4 feet.

### 3.2 FENCE INSTALLATION

- A. Temporary orange construction fence to protect the streambank from pedestrians shall be installed at top of bank until rail fence is installed.
- B. Post holes and excavations shall be excavated on the lines established by the Engineer to the depths and cross-sections shown on the standard drawings. Wooden posts may be driven when so prepared and any damaged posts shall be repaired or rejected. Post shall be plumb when set.
- C. All posthole filling and backfilling work shall be in six-inch layers and each layer shall be solidly tamped and compacted as it is placed.
- D. Posts and rails that are trimmed for post and pole connection mortise detail do not need two coats of preservative material. All other post or rail trim, cut, and/or modification need two (2) coats of preservative material approved by the Engineer.

## **PART 4 MEASUREMENT AND PAYMENT**

### 4.1 BASIS OF MEASUREMENT AND PAYMENT

- A. Wooden Rail Fence installation will be measured and paid for by the Linear Foot (LF) including all labor, equipment, materials, and incidentals required for the completion of the work. Payment includes linear footage for pedestrian pass rails and metal gate, if applicable. Cost to supply and install temporary construction fence for streambank protection is incidental to this section and to Bank Stabilization Section 02350.

**END OF SECTION 02820**

## SECTION 02910

### REVEGETATION

All applicable portions of this specification section in the MPWSS shall apply with the following additions, deletions and/or modifications.

#### PART 1 GENERAL

##### 1.1 DESCRIPTION

Add the following:

This work also includes conserving, placing, and finishing topsoil, coir wattle placement, willow cuttings acquisition and placement, erosion control fabric placement, and containerized plant installation at designated areas on the project drawings or as directed by the Engineer.

#### PART 2 PRODUCTS

##### 2.1 SEED

Add the following:

Utilize the following seed mix shown in Table 1 for all areas to be seeded.

**Table 1. Seed Mix**

Seed Name	% Pure Live Seed	Lbs. Per Acre
Western Wheatgrass	30	*
Streambank Wheatgrass	20	*
Hard Fescue	20	*
Slender Wheatgrass	15	*
Smooth Bromegrass	15	*

\* Drilled Rate = 25 lbs/acre, Broadcast and Hydroseed Rate = 50 lbs/acre

##### 2.2 TOPSOIL

Add the following:

Utilize all salvaged topsoil conserved from clearing and grubbing operations to cover excavation and embankment slopes prior to fertilizing, seeding, or mulching.

##### 2.4 FERTILIZER

Delete this Section.

Add the following:

## 2.6 WILLOW CUTTINGS

### A. Willow Cutting Collection Sites

At least two cutting source locations outside of the project area shall be identified by Contractor and approved by Engineer. Contractor will be responsible for identifying accessible sites and obtaining all necessary permissions and permits. Contractor shall use the following guidelines to increase success of cuttings:

1. Cuttings shall be collected from sites in the following order of preference:
  - 1) stands within construction limits (i.e. those stands that will be disturbed or removed during construction activities);
  - 2) stands within project limits
  - 3) within the Clark Fork River drainage upstream of the project site or with 10 miles downstream of the project site;
  - 4) other sites in the Clark Fork River drainage downstream of the project site;
  - 5) adjacent drainages in areas with a similar elevation to the project area and
  - 6) purchased from commercial sources. Contractor is responsible for identifying at least two collection sites outside the project area.
2. Cuttings shall be collected from a variety of approved locations and harvest should be spread throughout the stand.
3. Cuttings shall be collected from healthy, vigorous, native stands.
4. Site selection shall take into account the species preferences described in the following section.

### B. Willow Cutting Species and Sizes

Table 2 lists the species, size and percent of mix requirements of cuttings needed for the project. Willow cuttings from the following species should be collected based on percentages listed in Table 2: sandbar willow (*Salix exigua*), Drummond willow (*Salix drummondiana*), Pacific willow (*Salix lasiandra*), Booth willow (*Salix boothii*), and yellow willow (*Salix lutea*). Bebb willow (*Salix bebbiana*) and Geyer willow (*Salix geyeriana*) may also be collected, but should consist of a smaller total percent of collection than the other species. Red-osier dogwood (*Cornus sericea*) and thin-leaved alder (*Alnus incana*) may also be used as cuttings, but should only be used as part of a mix consisting primarily of willow species and collection should not exceed ten percent of the total number of cuttings collected.

It is understood that not all species identified as preferred species may be located for collection. After sites have been located and approved by Engineer, approximate quantities by species should be reported to Engineer.

<b>Table 2. Specifications for dormant shrub cuttings.</b>				
<b>Common Name</b>	<b>Scientific Name</b>	<b>Length (ft)*</b>	<b>Diameter (in)**</b>	<b>Percent of Mix</b>
sandbar willow	<i>Salix exigua</i>	4-6	0.5-2	Not to exceed 50%
Drummond willow	<i>Salix dummondiana</i>	4-6	0.5-2	Opportunistic
Pacific willow	<i>Salix lasiandra</i>	4-6	0.5-2	Opportunistic
Booth willow	<i>Salix boothii</i>	4-6	0.5-2	Opportunistic
yellow willow	<i>Salix lutea</i>	4-6	0.5-2	Opportunistic
Bebb willow	<i>Salix bebbiana</i>	4-6	0.5-2	Opportunistic
Geyer willow	<i>Salix geyeriana</i>	4-6	0.5-2	Opportunistic
red-osier dogwood	<i>Cornus sericea</i>	4-6	0.5-2	Not to exceed 10%
thin-leaf alder	<i>Alnus incana</i>	4-6	0.5-2	Not to exceed 10%

\*The minimum cutting length should be no less than 4 feet. Cuttings may be longer than 6 feet.

\*\*This is the preferred size range; however, cuttings up to 3 inches for shrub species are acceptable.

## 2.7 EROSION CONTROL FABRIC

Erosion control fabric shall consist of two layers, an inner fabric (Rolanka BioD-OCF30™) and an outer fabric (Rolanka BioD-Mat70™), or approved equals.

## 2.8 CONTAINERIZED PLANTS

Provide 411 containerized plants with weed mats and browse protectors. Provide root tight, disease free, native plants including propagation, growing, hardening off, packaging, and timely delivery as required by Engineer to the project site. Plant materials are subject to inspection prior to delivery to the site and at any time during plant production.

### A. Plant Mix

Table 3 identifies the planting mix, container size and plant quantities.

<b>Table 3. Containerized planting mix.</b>			
<b>Species</b>	<b>Common Name</b>	<b>Size*</b>	<b>Number of Plants</b>
Rosa woodsii	Woods Rose	Tall One	103
Populus Hastata	Black Cottonwood	Tall One	103
Crataegus Succulenta	Succulent Hawthorn	Tall One	103
Cornus Sericea	Red Osier Dogwood	Tall One	103

\* Tall One = 4-inch by 4-inch by 14-inch height container = 0.75 gallon

#### B. Plant Delivery

Contractor shall deliver plants in a disease and weed-free condition, and plants shall be root tight. For Tall One containers, two-year old shrub seedlings shall be a minimum of 12 inches in height. Herbaceous seedlings should be root tight and no older than two years unless specifically approved by Engineer. All plants shall be shipped in their containers and trays to promote proper handling at the site. All plant materials shall be hardened off to cold and full sun conditions prior to delivery. All seed sources and delivered nursery material should be approved or accepted by Engineer. All nursery stock should be free from weed species and will be dug, handled and stored with care and skill to prevent injury due to molding, rotting, drying or other damage to the vegetation.

#### C. Browse Protectors/Weed Mats

Provide browse protectors that encompass the entire plant after installation. Provide 3'x3' weed mats around each plant installation. Provide submittals of each to the project representative for approval.

### PART 3 EXECUTION

Add the following:

#### 3.6 WILLOW CUTTINGS

##### A. Collection Methods

Cuttings shall be collected using the following guidelines:

1. For cuttings collected during the growing season, cuttings should be collected as close to the installation date as possible. Engineer will provide a minimum of two weeks notice for collection quantities and delivery deadlines for cuttings to be delivered during the growing season.
2. Cuttings shall be collected from second or third year stems and taken from healthy plants showing no signs of disease, insect infestations, splits or deep furrows. Cottonwood pole cuttings can be older than three years.
3. For areas outside of construction limits no more than one-third of any individual plant should be removed for cuttings and harvesting activity should be spread throughout the stand.

4. Proper tools and equipment shall be used by the contractor to ensure the health and vigor of cuttings, i.e. tools shall be maintained so that they are sharp and clean.

#### B. Cutting Storage

To improve the success of these cuttings, the following guidelines should be followed:

1. Cuttings collected during dormancy store best under controlled environmental conditions including high relative humidity and cool air temperature. Climate and moisture conditions should be regulated in order to prevent cuttings from drying out or developing mold. Cuttings should be stored in a cool, dark, humid environment at 32 degrees to 38 degrees Fahrenheit and wrapped in breathable fabric such as burlap. Piles of wrapped willows stored in a cooler should be inspected and rotated every two weeks, moving plants from the bottom to the top of the pile, and results of inspection noted in progress reports.

#### C. Cutting Delivery

Cuttings shall be delivered in a disease- and weed-free condition. All plant material shall be handled, stored, and shipped with care and skill to prevent injury due to molding, rotting, drying or other damage to the vegetation. Delivery to the project site or pick-up from the storage facility shall be coordinated through Engineer. Cuttings shall be transported using the following guidelines:

1. For cuttings collected during the growing season, cuttings should be kept cool and moist and transported to the project site as soon as possible. Timing of collection during the growing season will need to be closely coordinated with construction schedules.
2. For cuttings collected during the growing season, cuttings should be stored in breathable fabric such as burlap and kept moist.
3. Cuttings should be kept out of direct sunlight and not stored in locations where they are likely to heat up.
4. Transporting cuttings in an open pickup or trailer should be avoided if heat build-up or wind desiccation is likely.
5. Transport time should be minimized when possible.
6. Upon delivery, cuttings should be placed in designated on-site storage areas, as directed by Engineer.

#### D. Willow Cutting Installation

Contractor shall place cuttings as specified in the project drawings. Willow cuttings shall be placed between the soil bundles so that no more than one-third of the length of the cuttings extends beyond the face of the subsequent bundle tier. **Willow cuttings shall be placed at a spacing of twelve (12) to fifteen (15) cuttings per foot.**

### 3.7 EROSION CONTROL FABRIC

Erosion control fabric shall be placed on the re-graded bank surface according to the project drawings. Erosion control fabric shall be staked in place with 12-inch wooden wedge stakes at a spacing of one stake per 10 feet on center and on the ends of the fabric.

### 3.8 CONTAINERIZED PLANTS

#### A. Plant Installation

1. Plants should be installed within appropriate micro-sites in each of the designated planting areas based on site microtopography and hydrologic requirements of the species.
2. Planting holes should be at least three times the diameter of the container.
3. Planting hole depths will vary depending upon the species of plant to be installed. The majority of plants should be planted so that their root collars are flush with the surface.
4. Plants should be removed from their containers and the roots loosened if they are excessively root bound. The soil in and around the planting hole should be loosened to allow the roots to expand freely once the tree or shrub is planted. Once the shrub or tree is in the planting hole and appropriate amendments have been added, the hole should be back filled and gently tamped to remove any air pockets.
5. Where specified, 3' x 3' weed mats should be placed around the planted shrub or tree to suppress competition.
6. Where specified, individual browse protectors or browse exclosures should be installed around planted shrubs or trees.
7. Plants should be watered in using 5 gallons of water within one hour of being planted. After watering in, additional growth media should be added to fill the planting hole if needed.

## PART 4 MEASUREMENT AND PAYMENT

### 4.1 GENERAL

Delete this section and add the following:

- A. Placing conserved topsoil and seeding will be measured and paid by square yard (SY).
- B. Payment for bank stabilization efforts are per Section 02350.

**END OF SECTION 02910**

## **SECTION 02930**

### **SIGNING**

#### Added Section.

#### **PART 1 GENERAL**

##### **1.1 DESCRIPTION**

- A. This work consists of furnishing and placement and/or removal and reset of signs and sign posts at designated areas on the project drawings or as directed by the Engineer. This work also consists of the mounting and complete installation of FWP supplied signing at designated areas on the project drawings or as directed by the Engineer.

#### **PART 2 PRODUCTS**

##### **2.1 WOOD POSTS**

- A. Furnish posts from dry no. 1 grade Douglas fir, southern or Ponderosa pine, hemlock, spruce, or western larch conforming to AASHTO M 168. Treat the posts with water-borne preservative ACA, ACZA, or CCA according to AWPA Standard C14 except the minimum preservative retention is 0.40 pounds per cubic foot.

##### **2.2 HARDWARE**

- A. Furnish galvanized steel or aluminum alloy material for lag screws, washers, clip angles, wood screws, shear plates, U-bolts, clamps, bolts, nuts, and other fasteners.

#### **PART 3 EXECUTION**

##### **3.1 GENERAL**

- A. Sign locations may be changed to fit field conditions as approved by the Engineer. Determine sign support lengths measured from the top of the sign to bottom of the footing. Backfill signs supports and post by tamping with hand tools and/or mechanical equipment. Install sign supports according to the project drawings or as directed by the Engineer.

##### **3.2 INSTALLATION**

- A. Install signs per the plan drawings. For County Road or Highway sign installations, refer to the Montana Department of Transportation (MDT) Standard Detail Drawing 619-00 regarding sign clearances and mounting heights. Drill breakaway holes according to MDT Standard Detail Drawing 619-20. No concrete footings are required.

#### **PART 4      MEASUREMENT AND PAYMENT**

##### **4.1      PAYMENT**

- A.      Sign post and panel installation (FWP supplied sign panels) will be measured and paid for by the each (EACH).

**END OF SECTION 02930**

## **SECTION 03284**

### **PLANTING IRRIGATION**

Added Section.

#### **PART 1 GENERAL**

##### **1.1 DESCRIPTION**

- A. This work consists of installation of the irrigation system per the details provided in the Project Drawings. Irrigation system includes installation of pipe, valves, timer control and on-site storage tank.

#### **PART 2 PRODUCTS**

##### **2.1 PIPES**

- A. Comply with Project Drawings for application of pipe size, fitting materials, and for joining methods for service locations and pipe sizes.
- B. PE Pressure Pipe: with DR of 7 and PE compound number required to give pressure rating not less than 200 psi.

##### **2.2 MANUAL VALVES**

- A. Plastic Ball Valves and Globe Valves made of PVC with a pressure rating of 150 psi. Can be socket or threaded end connection. Sizes per the Project Drawings.

##### **2.3 TRANSITION FITTINGS**

- A. Same size as, and with pressure rating equal to and with ends compatible with, piping to be joined. Sizes per the Project Drawings.

##### **2.4 CONTROLLER VALVE**

- A. Control Valve to be battery operated and run off a 9 volt battery. Simple push button programming. Battery indicator shows remaining battery life.

##### **2.5 STORAGE TANK**

- A. Tank to be of a capacity of 3000 Gallons. Tank to be per the approximate dimensions listed on the Project Drawings. Tank to be HDPE and have a lockable access lid no smaller than 16" in diameter. Tank walls to be translucent and equipped with gallon indicators.

## 2.6 FENCE

- A. Fence to be temporary 8' tall chainlink.

## **PART 3 EXECUTION**

### 3.1 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Section 02350.

### 3.2 PIPING INSTALLATION

- A. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved on Coordination Drawings.
- B. Install fittings for changes in direction and branch connections.
- C. Drill 1/8" orifice every 2 feet in pipe laterals and provide end cap at the end of each line.

### 3.3 VALVE INSTALLATION

- A. Underground Ball Valves: Provide 150 lb. minimum concrete block to anchor ball valves. Bury block flush with grade. Mechanically fasten valve(s) to block(s) with stainless steel straps on each side of valve body.

### 3.4 CONTROLLER VALVE

Place and secure Timer Control Valve in area approved by Project Representative. Install control valve per Manufacturer's recommendations.

### 3.5 STORAGE TANK INSTALLATION

Place and install storage tank in the location per the Project Drawings. Tank must be leak tested for 8 hours prior to being connected into the system.

### 3.6 FENCE

- A. Install fence around the outside of tank and per manufacturers recommendations.

## **PART 4 MEASUREMENT AND PAYMENT**

### 4.1 PAYMENT

- A. Planting Irrigation installation shall be paid by the lump sum (LS) basis including all labor, equipment, materials, and incidentals required for the completion of the work.

**END OF SECTION 03284**

**SECTION 03310**  
**STRUCTURAL CONCRETE**

All applicable portions of this specification section in the MPWSS shall apply with the following additions, deletions and/or modifications.

**PART 1      GENERAL**

**1.1      DESCRIPTION**

Add the following:

- B.      FWP will provide a grooving tool(s) for producing a grooved finish on the concrete surface. The tool(s) provided by FWP shall be returned cleaned. The finishing tool surfaces shall be free of hardened concrete and in good condition. A cleaning cost of \$250.00 will be retained if the tool(s) are returned not cleaned or poorly cleaned. Additional costs for repair or replacement of damaged tools may also be retained.

**PART 2      PRODUCT**

**2.1      CLASSIFICATION**

Add the following to Subsection A.1:

- 1.      Use M-4000 concrete for all boat ramp concrete.

**PART 3      EXECUTION**

**3.4      PLACING CONCRETE**

- A.      Delete the last sentence.

Add the following:

- B.      Provide written and/or verbal communication notice to the Project Manager three (3) working days, excluding Saturday and Sunday, prior to any project concrete pour, regardless of pour quantity. For clarification, all written communication notices have to be received in the FWP Design and Construction Office per this requirement. Failure to provide notification will result in a deduct of pour quantity from the associated bid item. Lump sum bid items will be deducted based on the concrete placed percentage.

### 3.4A CONCRETE V-GROOVE FINISHING

#### A. Required Accuracy

1. The Contractor shall construct all specified work as shown on the project drawings within the specified tolerances, shown in Table 1. The following are reasonable tolerances that allow for a maximum specified deviation which may occur in the field during construction. Deviations beyond any values listed below may result in reduction in payment, or rejection, in part due to poor aesthetics, loss of functionality, or does not meet desired design criteria.
2. If the Contractor fails to meet specified tolerances, that portion of the work area, as specified below, may be reduced in payment or rejected, removed and replaced in accordance with General Conditions, ARTICLE 12 – UNCOVERING AND CORRECTION OF WORK.

**Table 1. V-Groove Finish Tolerances**

<b>Criteria</b>	<b>Tolerance</b>
V-Groove Angle Orientation	10 degrees
V-Groove Depth	0.25"
V-Groove Connections (End to End Alignment)	0.5"

#### B. Concrete V-Groove Finish

1. Provide a v-groove finish on all ramp surfaces as shown in the project drawings or directed by the Project Representative. Provide adequate laborers to begin concrete v-groove finish during concrete placement. Timing of v-grooving finish is critical.
2. Factors that may influence the v-groove finish and concrete performance include air content, water content, add-mixtures and strength. Some Contractors delay starting the finish, or may have a tendency to add water to the concrete surface, in order to achieve a "perfect" ramp finish. This must be avoided, as significant amounts of water in the surface layer will result in weak strength of the v-grooves, which at best contain less quantity of large aggregate due to the nature of the finish process. Refer to the Technical Specifications for other influential factors including, but not limited to: mix design, mixing and placement time, weather, correct placement of rebar, and correct thickness of ramp.

#### C. V-Groove Rating Score

1. The following rating score shall be used to determine allowable tolerances for all v-groove concrete finishes. The Project Representative shall make the final determination on any deficient or unacceptable area, determine the rating score, and conduct measurements as deemed necessary for evaluation. Three

(3) v-grooving evaluation criteria will be considered in determining the rating score including: appearance; angle orientation; and depth. A criteria rating score will be assigned for each based on the V-Groove Rating System, shown in Table 2. An overall, or final, rating score is made by averaging the three criteria rating scores. Final rating scores will be rounded to the nearest whole number.

Rating Score

- 1 Unacceptable, Contractor shall replace that portion of the ramp.
- 2 Poor, Reduction of 50% in payment for that portion of the ramp, or Contractor shall replace that portion of the ramp.
- 3 Fair, Minimum acceptance range.
- 4 Good.
- 5 Excellent, Letter of commendation to Contractor.

**Table 2. V-Groove Evaluation Rating System**

Evaluation Criteria	Criteria	Area	Score
V-Groove Appearance (top or bottom of groove)	Shallow, Uneven, Rough, Torn	40+ sf	-5
	Rounded, Flat, Semi-Rough	80+ sf	0
	Sharp, Crisp, Clean, Smooth		5
V-Groove Angle Orientation	0-5 or >56 degrees	40+ sf	1
	6-10 or 51-55 degrees	40+ sf	2
	11-15 or 46-50 degrees	80+ sf	3
	16-24 or 41-34 degrees	80+ sf	4
	25-35 degrees		5
V-Groove Depth	0.00" to 0.20"	40+ sf	1
	0.21" to 0.40"	40+ sf	2
	0.41" to 0.50"	80+ sf	3
	0.51" to 0.60"	80+ sf	4
	0.61" to 0.75"		5

### 3.4 TESTING

#### A. 3. Compression Tests

Add the following to subsection a.:

Mold a minimum of three (3) field cure cylinders (6-inch diameter), for each day of concrete placement. Follow requirements for field curing and strength testing found in this section.

## PART 4 MEASUREMENT AND PAYMENT

### 4.1 GENERAL

Add the following:

- B. Cast-in-Place Concrete Boat Ramp will be measured and paid for by the square foot (SF) in place including all labor, equipment, materials, and incidental required for the completion of the work.
- C. Cast-in-Place Concrete Sidewalk will be measured and paid for by the square foot (SF) in place including all labor, equipment, materials, and incidental required for the completion of the work.

**END OF SECTION 03310**

## **SECTION 03321**

### **CURB STOPS**

Added Section.

#### **PART 1 GENERAL**

##### **1.1 DESCRIPTION**

- A. This work consists of furnishing and placement of curb stops at designated areas on the project drawings or as directed by the Project Representative. This work also includes removing and resetting existing curb stops as directed by the Project Representative.

#### **PART 2 PRODUCTS**

##### **1.1 CURB STOPS**

- A. Furnish pre-fabricated concrete curb stops (84" min. length) as designated on the project drawings or as directed by the Project Representative.

#### **PART 3 EXECUTION**

##### **3.1 GENERAL**

- A. Install curb stops at locations as designated on the project drawings or as directed by the Project Representative. Furnish and place No. 5 rebar measuring 3 feet in length to hold curb stops in place. Drive rebar flush with the top of each curb stop.

#### **PART 4 MEASUREMENT AND PAYMENT**

##### **4.1 PAYMENT**

- A. Curb stops will be measured and paid for by the each (EACH).

**END OF SECTION 03321**

## SECTION 03350

### CONCRETE CABLE MAT

#### Added Section.

#### **PART 1 GENERAL**

##### 1.1 DESCRIPTION

- A. This work consists of the installation of pre-fabricated concrete cable mat block materials at designated areas on the project drawings or as directed by the Project Representative.

#### **PART 2 PRODUCTS**

##### 2.1 GENERAL

- A. For interior blocks, furnish Concrete Cable Mat meeting the requirements of Class 50, 6" thick open cell block, ArmorFlex® or approved equal. For exterior blocks, furnish Concrete Cable Mat meeting the requirements of Class 55, 6" thick closed cell block, ArmorFlex® or approved equal.

ArmorFlex® products can be purchased through:

Contech Construction Products  
2905 N. Montana, Suite 203  
PO Box 5478  
Helena, MT 59604  
406-431-1082

#### **PART 3 EXECUTION**

##### 3.1 PREPARATION

- A. Excavate ramp to the lines and grades as shown on the project drawings.
- B. Place, spread, and level gravel leveling course to the dimensions shown in the plans and per Section 02236.
- C. Place and secure geotextile per Section 02110.

##### 3.2 PLACEMENT

- A. Place cable mats using bars and other means to ensure proper interlocking. Take up slack in the cable and secure by tying to the ramp steel reinforcing or by clamping with cable clamps.

- B. Spread gravel leveling course to fill voids between and in blocks to secure in place. Backfill over sloped outside edges of cable concrete with conserved excavation. Backfill any over excavation at the lower end of the mat with conserved excavation.
- C. Mat construction and connections to be as per manufacturer's directions.
- D. Backfill over buried ends and sides of the mat shall be from conserved excavation.

### 3.3 TOLERANCES

- A. The finished surface of the concrete block mat shall not vary from the staked grade more than 3 inches.
- B. Variation of elevation from side to side at any one station shall be 2.5 inches or less.
- C. Total distance of level surface between the start of roll off on each side shall vary from the specified width by no more than 6 inches.

## **PART 4 MEASUREMENT AND PAYMENT**

### 4.1 GENERAL

- A. Concrete cable mat placement will be measured and paid for by the square foot (SF) including all labor, equipment, materials, and incidentals required for the completion of the work.

**END OF SECTION 03350**